Amendments to the Specification:

Please replace paragraph [0006] with the following amended paragraph:

[0006] An inductance of the saturable iron core is very high until the core is saturated, and when a product of a voltage and time reaches a predetermined value, the inductance of the saturable iron core decreases abruptly. For the sake of explanation, it is assumed that inductance values of the saturable iron cores ~~8-1, 8-2, 8-3~~ 8-1, 8-2, 8-3 and 8 are decreased in this order and the capacitors 3-1, 3-2 and 3-3 have a same capacitance value. After the switch 4 has been made conductive and the saturable iron core 8-1 has been saturated at an instance T_0, voltage pulses v1, v2 and v3 appearing across the capacitors 3-2, 3-3 and 7 are successively compressed on a time axis as depicted in Fig. 3. That is to say, the voltage pulse v1 appearing across the capacitor 3-2 begins to increase from the instance T_0 and becomes maximum after a time duration T_1. Since the circuit is designed such that the saturable iron core 8-2 is saturated at such a time instance, the voltage pulse v2 appearing across the capacitor 3-3 begins to raise and becomes maximum after a time period T_2. At this time, the saturable iron core 8-3 is saturated and the voltage pulse v3 begins to raise. After a time period T_3 which is shorter than the time period T_2, the voltage pulse v3 reaches a maximum value. In this manner, the voltage pulse v3 having a sharp raising edge as well as a relatively short pulse width can be applied across the load 5.

Please replace paragraph [0008] with the following amended paragraph:

[0008] In the known high voltage pulse generating circuit, the switch 4 is generally formed by a thyratron which is a kind of vacuum ~~tubes~~ tube. Since the thyratron has a very high switching speed and can be used under a high voltage, the switch 4 can be formed by a single thyratron, and therefore an inductance of the switch 4 is small. However, the thyratron has the following demerits:

(1) The thyratron ~~could not~~ cannot operate at a high repetition frequency.

(2) The thyratron ~~could not~~ cannot be self-turned off, and thus a limitation is imposed upon designing the circuit.

(3) The thyratron has a short lifetime and maintenance is cumbersome and expensive.

(4) The thyratron requires a heater circuit as well as a gas control, and therefore ~~a whole~~ the overall circuit is liable to be complicated.

(5) The thyratron ~~has malfunction~~ malfunctions due to jitter and miss-ignition.

Please replace paragraph [0009] with the following amended paragraph:

A1 cont'd

[0009] Recently semiconductor switches have been developed in accordance with the progress of power electronics, and there have been designed semiconductor switches which can turn-on and turn-off a large current under a high voltage. However, a semiconductor switch has a lower withstand voltage and could not be substituted for the thyratron. A switch is composed of a series circuit of a number of semiconductor switches and a necessary circuit voltage is sheared by these semiconductor switches. In order to turn-on simultaneously the semiconductor switches connected in series, it is necessary to provide special gate driving circuits. Furthermore, a high voltage is applied between the gate driving circuits, and therefore gate power sources and gate control signals have to be isolated from each other. In general, a remarkable advantage could not be attained by only replacing the thyratron by a series circuit of semiconductor switches.

Please replace paragraph [0015] with the following amended paragraph:

A3

[0015] In a preferable embodiment of the high voltage pulse generating circuit according to the invention, said first semiconductor switch is constituted by a semiconductor switching element having a low withstand voltage and said second semiconductor switch is constructed by a series circuit of a plurality of semiconductor switching elements having a high withstand voltage, the number of said plurality of semiconductor switching elements being determined in accordance with an amplitude of an output voltage pulse to be generated. There are further provided a plurality of iron cores, the number of which is equal to that of said plurality of semiconductor switching elements. A primary winding passing through said plurality of iron cores is connected in series with said free-wheel diode, and a plurality of secondary windings each passing through respective iron cores are connected to gates and cathode terminals of respective semiconductor switching elements of said series circuit of semiconductor switching elements. In this case, it is particularly preferable that each of the semiconductor switching elements of said series circuit is formed by a static induction thyristor. However, according to the invention, the semiconductor switching elements may be formed by another

A³ cont'd

semiconductor switching element such as an insulated gate bipolar transistor (IGBT) which has a turn-off faculty.

Please replace paragraph [0017] with the following amended paragraph:

A⁴

[0017] Fig. 4 is a circuit diagram showing a first embodiment of the high voltage pulse generating circuit according to the principal conception of the present invention. There is arranged a low DC voltage source 11 whose output voltage can be determined [[in]] regardless of [[to]] an amplitude of an output high voltage pulse to be generated. A positive output terminal of the DC voltage source 11 is connected to its negative output terminal by means of a series circuit of a first switch 12 having turn-on and turn-off faculty and a lower withstand voltage, an inductance 16 for storing a inductive energy, and a second switch 14 having turn-on and turn-off faculty and a higher withstand voltage. The first switch 11 having the turn-on and turn-off faculty serves to perform the supply and stop of the inductive energy to the inductance 16 and can be formed by a switching element having a lower withstand voltage. The second switch 14 also having the turn-on and turn-off faculty operates to perform the supply and release of the inductive energy of the inductance 16 and the output high voltage is applied to the second switch. Therefore, the second switch 14 should have a higher withstand voltage than that of the first switch 12.

Please replace paragraph [0025] with the following amended paragraph:

A⁵

[0025] As explained above, in the high voltage pulse generating circuit according to the invention, an extremely high voltage pulse can be generated by the very simple circuit using [[the]] a less expensive and small low voltage DC source by effectively utilizing the semiconductor switches having the turn-off faculty instead of the thyratron which does not have a turn-off function. Furthermore, it is an important merit of the circuit according to the invention that the inductance of a circuit portion including the second switch 14 do not affect principally the generation of the output voltage pulse.

Please replace paragraph [0029] with the following amended paragraph:

A⁶

[0029] Next the operation of the second embodiment of the high voltage pulse generating circuit according to the invention will be explained with reference to Fig. 5. At a time instance t_0, the power MOSFET 24 is turned-on and a current flows from the capacitor 23 of the direct current smoothing circuit to the parallel circuit of a capacitor 29 and resistor 30 via

the power MOSFET 24 and magnetic cores 26 1~26-4. The capacitor 29 operates as a speed-up capacitor for flowing a large current immediately after turning-off of the power MOSFET 24. The resistor 30 serves to flow an intermittent current. ~~Same currents flow~~ The same current flows in the secondary windings 28-1~28-4 coupled with the magnetic cores 26-1~26-4 in such a direction that a magnetic flux induced by the current flowing through the primary winding 27 is cancelled out. These currents serve as on gate currents for the static induction thyristors 25-1~25-4, and these static induction thyristors are made on simultaneously. In this manner, the power MOSFET 24 and static induction thyristors 25 (all the static induction thyristors 25-1~25-4) are made conductive, and the current flows to the inductive energy storing inductance 16. After that, the circuit operates in [[a]] the same manner as that of the above explained first embodiment. Here, the current flowing to the inductive energy storing inductance 16 does not raise abruptly, and it is not necessary to turn-on the static induction thyristors 25-1~25-4 abruptly. Therefore, it is not always necessary to provide the capacitor [[30]] 29, [[and]] in which case only the resistor [[29]] 30 may be arranged.

A6 cont'd

Please replace paragraph [0033] with the following amended paragraph:

[0033] In the second embodiment, the first semiconductor switch is formed by the power MOSFET 24 and the second semiconductor switch is constructed by the static induction thyristors 25-1~25-4. It should be noted that these semiconductor switches may be formed by any other semiconductor switching element such as another type of transistors and IGBT (when it is used as the second semiconductor switch, a care should be taken in a point that it is a voltage driven device and a limitation is imposed upon a gate-emitter voltage). Furthermore, in the second embodiment, the second semiconductor switch is constituted by the series circuit of the four static induction thyristors 25-1~25-4, but according to the invention, the number of static induction thyristors is determined by a peak value of the output pulse voltage. It is a matter of course that the load is not limited to the capacitive discharge circuit. Moreover, the first switch 12 and inductive energy storing inductance 16 are connected to the positive output terminal of the direct current voltage source, but according to the invention, the same function can be attained by connecting [[these]] the first switch and inductive energy storing inductance to the negative output terminal as shown in Fig. 7. Alternatively, one of the first switch 12 and inductive energy storing inductance 16 may be connected to the negative output terminal of the voltage source.

A7

Please replace paragraph [0036] with the following amended paragraph:

A[9]

[0036] In the above explained first to fifth embodiments of the present invention, each of the first and second switches are formed by a semiconductor switch and it is possible to generate a high voltage output pulse having an amplitude of several kVs to several tens kV and a pulse duration of several tens <u>of</u> nano seconds to several hundreds <u>of</u> nano seconds.